REMARKS

The specification has been amended to correct minor clerical errors and to employ more idiomatic English. No new matter has been entered by any of the foregoing amendments. Pursuant to 37 CFR 1.121, a marked copy of the specification paragraphs showing the changes made therein accompanies this amendment.

The claims have been rewritten to better define the claimed invention and better distinguish the invention from the prior art. Claim 10 has been rewritten as new claim 28 and is believed to satisfy the requirements of 35 USC § 112.

The finality of the restriction requirement is noted. It is requested that non-elected claims 19 and 20 be maintained in this application, without further action thereon, for possible rejoinder and/or for filing of a Divisional Application.

The objection to the drawings is noted. Corrected formal drawings will be filed upon allowance of the application.

Turning to the art rejections, the Lewandowski et al. U.S. Patent is quite different from the claimed invention. A feature and advantage of the claimed invention is the ability to change measuring parameters without exchanging the sensor or array of sensors. (See the paragraph bridging pages 6 and 7 of the specification, and the last full paragraph on page 10 of the specification.) Lewandowski et al. does not teach this. Lewandowski et al. is concerned simply with the increase of the lifespan of platinum electrodes when measuring glucose levels.

Moreover, Lewandowski et al. take their readings at a generally uniform voltage level (see col. 5, lines 44-53), whereas the present claimed invention measures transient pulse response areas.

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In Lewandowski et al., their discussion of varying levels etc. does not mean that transient measures are taken, only that the pulses may be at different levels. These levels change slowly from pulse to pulse, and the changes can thus not be considered as transients, and measuring for each pulse is obviously made at two points in the level essentially static part of each pulse. In comparison, the present claimed invention measures the dynamic part of the pulse response. Thus, there is nothing in Lewandowski et al. that would lead someone skilled in the art towards the present claimed invention.

Having dealt with all the objections raised by the Examiner, it is believed the application is now in order for allowance. Early and favorable action are respectfully requested.

In the event there are any fee deficiencies or additional fees are payable, please charge them (or credit any overpayment) to our deposit account number 08-1391.

RESPECTFULLY SUBMITTED

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231 on April 22, 2002, at Tucson, Arizona.

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MARKED COPY OF SPECIFICATION PARAGRAPHS

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MARKED SPECIFICATION PARAGRAPHS:

Paragraph beginning at page 1, line 2:

There is a growing interest in recent years for the concept of electronic noses. An electronic nose [consist] consists of an array of gas sensors with different selectivity patterns, a signal collecting unit and pattern recognition software applied to a computer. The principle is based on the fact that a large number of different compounds contributes to define a measured odor, the chemical sensor array of the electronic nose then provides a pattern output that represents a synthesis of all the components. The pattern output is given by the selectivities of the various sensors. The very essence of the electronic nose is that the combination of several specificity classes has a very large information content.

Paragraph beginning at page 1, line 22:

Similar concepts, denoted "taste sensors", have also been described. Thus, a LAPS (light addressable potentiometric sensor) with artificial lipid membranes as ion selective material has been described (Ref 4), as well as taste systems, based on a [fiberoptical] fiberoptic sensor array using potential sensitive dyes (Ref 5) or on a surface photovoltage technique applied to Langmuir-Blodgett films (Ref 6).

Paragraph beginning at page 1, line 32:

A common feature for these electronic tongues or taste sensors described, is that the sensing principle is based solely on potentiometry, the charging of a membrane being measured. This will limit the area of detectable compounds to ions or other charged species.

Paragraph beginning at page 2, line 4:

Thus, these known taste sensors are not sufficiently discriminating to allow, for instance, for quality monitoring in e.g. food processes. The variation in the response to different

parameters is not sufficient and despite the use of pattern recognition methods as known from the electronic nose technique the resulting patterns are not separable with sufficient precision.

Paragraph beginning at page 2, line 10:

Furthermore, potentiometric measurements per se are sensitive to electronic noise, putting high demands [to] on the electronics and measurement set-up.

Paragraph beginning at page 2, line 13:

In view of the above mentioned problems encountered with known taste sensors or electronic tongues, the object of the invention is to improve the pattern response to variations in tested substances. This object is achieved by a generation of transients by applying electrical pulses to electrodes in contact with the substance to be investigated. For instance, voltage pulses may be applied and the current [be] monitored. Transients will appear at the front and at the rear of the measured current pulse. The transients or some part thereof is then registered and used for comparison purposes, either with measurements at preceding pulses to control continuity in, for instance, a production process or for comparison of what we could call a library of previously registered values for substance detection purposes. For the purpose of simplicity we have in the following mainly discussed the initial transient, however, the pulse end transient can be used in a similar manner and at times it may perhaps be of advantage to [used] use measured values from both transients.

Paragraph beginning at page 2, line 26:

Normally, in [voltametry] voltammetry for instance, the very first moments when electricity is applied to the electrode is not considered at all and one normally waits for the more steady state and thus more easily predictable conditions that follow. For the invention which may be employed to give an electronic tongue, it has, however, been found that the initial signal

transient response obtained when electricity is applied will vary significantly when the tested substances vary and thus the pattern will also vary with different voltages, pulse wave forms and frequencies.

Paragraph beginning at page 3, line 1:

Contrary to known measuring techniques, the initial transients are recorded instead of the later stabilized conditions. The great variation obtained is however of great advantage in the invention (for instance an electronic) tongue [were] where the important thing is to achieve as different patterns as possible for small changes in test [substance] substances. Whether the changes in signal response are predictable in a calculable sense of the word or not are however without interest provided that a given change [result] results in the same recognition pattern change every time, which it does. The normal disadvantage can thus be considered as an advantage [at] of the invention.-

Paragraph beginning at page 3, line 10:

The use of the transients for recognition (analysis) or monitoring can be done in many different ways. The entire transient curve can be [registered] recorded and processed or the values at specific times from pulse onset may be used. These values can then be treated by multivariate methods to gain the desired information or control parameters. If these are few, only a few significant measured transient values may suffice either consisting of perhaps as little as one value taken after pulse onset but before the peak value, of the peak value only or of a value taken very shortly after the peak, within, for instance, 90% or preferably 95% of the peak value. Of course, [also]combinations of these can be considered.

Paragraph beginning at page 3, line 19:

In particular, when the transient measurements are used together with multivariate methods, the resolution or precision may be enhanced by, for instance, varying the pulse amplitude, for instance the voltage at [voltametry] voltammetry. Due to the difference in electric field strength, the present substances will react, in particular move, with differing agility depending on size, binding to other substances, etc.

Paragraph beginning at page 5, line 16:

Since the pulses may be short, the influence of the measuring on the tested substance may become negligible, also the shape and size of the electrodes may be chosen more freely. For instance, the electrodes may have a larger size than [normally] normal, thus increasing the signal response and an integration over a larger area or volume of the measured substance, diminishing the risk of undesired substance variation influence. Also, the short pulses allow rapid testing or monitoring as well as the collection of responses from a great number of pulses with different voltages.

Paragraph beginning at page 6, line 12:

When using pulsed voltammetry, information can also be obtained from AC current versus frequency curves at various potentials. The potential may vary around zero (fig 4) or be superimposed on [an other] another arbitrary [statical] static or [dynamical] dynamic potential curve (fig 6).

Paragraph beginning at page 6, line 16:

In continuous voltammetry, the current depends [of] on the diffusion rate of electroactive species to the working electrode. If the stirring rate in the measurement cell is changed, also the electrode current is changed. One way to overcome this is to use microelectrodes, due to

favourable diffusion profiles, [an other] and another way is to use pulse voltammetry, conductometry, effect or energy measurements.

Paragraph beginning at page 6, line 22:

Pulse [voltametry] voltammetry also enables the use of macroelectrodes that can be cleaned by rather harsh methods, which often is necessary to get clean electrode surfaces. [Microelectrode] Microelectrodes are much more fragile.

Paragraph beginning at page 6, line 26:

The invention also deals with the aspect of influencing the measured solution at one position and to make measurement at [an other] another position, so close that measurement will be affected. This means that compounds generated at one electrode are detected (together with other compounds in the solution) by the other electrode. Since both electrodes may be operated at different potentials and pulse conditions, a very large but also very complicated information concerning the measured solution may be obtained increasing the possible variations in the transients and thus provide a big base for the pattern recognition. In case of streaming or flowing liquids being tested, influencing electrodes or materials as, for instance, catalytic materials, can be placed upstream of some electrodes to change the composition before it is tested by other electrodes.

Paragraph beginning at page 7, line 5:

Further developments of the invention are apparent from the [subclaims and the] following description of experimental tests of the invented method. The description [refer] refers to the appended drawings showing:

Paragraph beginning at page 7, line 19:

Figure 5 A typical recording from SAPV, also showing the position of measurement points. Pulse time and time between pulses are also indicated[.]; and

Paragraph beginning at page 10, line 5:

A further development of the concept is also to use other metals as working electrodes, such as palladium, rhodium, and iridium or in some other way change the electrode properties by e.g. surface modifications, use of alloys, etc. Furthermore, electrodes and setups may be used [were] where the measuring electrodes or special electrodes influence the tested liquid. The invention is not limited to liquid matter since solid matters can be tasted by wetting and then testing.

Paragraph beginning at page 10, line 12:

In a practical embodiment of the invention, a tasting cell can be a part of a simple pump, for instance, a rotary vane pump. The electrodes may be arranged in a wall of the pump body[. The], the axial wall or the peripheral wall. The vane is preferably provided with a brush part that serves as some sort of a seal against the wall. The brush will, of course, not provide a watertight seal, but since this pump is not intended to give pressure, this is not important. What is important is, however, that the electrodes will be continuously swept clean by the brush. Also, the pump or tasting cell will be extremely [unsensitive] insensitive to larger particles. Actually, the vane may be constituted entirely of a [brush like] brush-like structure. Alternatively, the vane may be a rubber blade pretensioned against the wall of the cell.

Paragraph beginning at page 11, line 8:

In the case with a [screw like] screw-like brush element centrally in the taste cell, the center of the brush element may constitute an auxiliary or reference electrode with the working electrodes on the cylinder wall. The electrodes on the wall may be constituted by circles

rendering them rather [unsensitive] insensitive to variations in the measured sample. Also, this makes it possible to fabricate a very rugged cell boy in a simple way by simply arranging alternating [cylindric] cylindrical conductive and insulating rings on top of each other. The electrodes may instead have an axial extension.

Paragraph beginning at page 11, line 16:

Preferably, the feeding speed of the pump is kept contact at each test and [the in] in the tests that are to be comparable.

Paragraph beginning at page 11, line 19:

If the electrode is not continuous around a rotor, measuring deviation may occur when the brush passes and shields the electrode. [by]By synchronizing the rotation with the pulse frequency, this effect can be made invisible.